

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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DEC 30 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
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)

Amendment of the Commission's)
Rules to Establish New Personal)
Communications Services)
)

DOCKET FILE COPY ORIGINAL

GEN Docket No. 90-314
RM-7140, RM-7175, RM-7618

COMMENTS ON THE PETITIONS FOR RECONSIDERATION

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December 30, 1993

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SUMMARY

Northern Telecom, along with some 63 other parties, filed petitions for reconsideration of the PCS Order. Many of the other parties had requested relief similar to that in Northern Telecom's petition -- an increase in the power limits for licensed PCS and changes to the unlicensed PCS rules to more closely reflect the WINForum Spectrum Etiquette. Northern Telecom welcomes the support of these other petitioners.

With respect to filings addressing the licensed PCS rules, Northern Telecom supports those petitioners seeking an increase in the base station power to 1600 watts EIRP, which is consistent with Northern Telecom's initial request for an increase to at least 1000 watts. An updated study performed by MLJ reveals that an increase to 1600 watts EIRP will not lead to additional interference to the incumbent licensees.

Northern Telecom also supports the petitioners seeking to designate different portions of the spectrum for mobile-to-base and base-to-mobile communications, which will help minimize interference. In addition, while Northern Telecom strongly supports the role of voluntary, industry-developed standards, it urges the Commission to reject the requests of a few petitioners for the FCC to become actively involved in the standards setting process. The resulting delay would ill-serve the public interest. Northern Telecom also requests that the Commission accept the Telocator proposal for out-of-band emission limits,

including the notes accompanying the proposal as part of the rules.

With respect to filings addressing the unlicensed PCS rules, Northern Telecom disagrees with the petitioners seeking to eliminate the 1.25 MHz channelization scheme adopted by the Commission in the PCS Order. Northern Telecom additionally urges the Commission to reject the pleas of a limited number of parties seeking to reallocate the unlicensed PCS spectrum so that the relatively uncongested spectrum is assigned solely to asynchronous devices. Northern Telecom also suggests that the Commission reject the request to expand the minimum listening period from 10 milliseconds to 20 milliseconds, and to raise the threshold for "cooperating devices," an undefined term. Finally, Northern Telecom does not believe that any rule changes are necessary with respect to certification of equipment, or the designation of UTAM as the spectrum clearing and coordinating entity for unlicensed PCS.

Table of Contents

	<u>Page</u>
SUMMARY	i
I. Licensed PCS Issues	3
A. The Record Supports An Increase In The Maximum Base Station Power	3
B. The Commission Should Reject Calls To Become More Actively Involved In The Standards Setting Process	6
C. Spurious Emission Limits	9
D. Allocated Pairs For Uplink And Downlink Signals	11
II. Unlicensed PCS Issues	12
A. Channelization	12
B. Spectrum Allocation	13
C. Listen-Before-Talk	14
D. Listen-Before-Talk Threshold	15
E. Certification Of Unlicensed PCS Equipment	16
F. Apple's Comments Regarding UTAM	17
CONCLUSION	17

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COMMENTS ON THE PETITIONS FOR RECONSIDERATION

Northern Telecom Inc. ("Northern Telecom") hereby comments on several of the petitions for reconsideration filed with respect to the decision establishing service rules for Personal Communications Services ("PCS").^{1/} Some 63 parties in addition to Northern Telecom filed petitions for reconsideration of the PCS Order. In its petition for reconsideration, Northern Telecom sought an increase in the maximum power for licensed PCS base stations to at least 1000 watts, and requested that the unlicensed PCS rules be modified to incorporate several provisions of the WINForum Spectrum Etiquette that had not been reflected in the rules.

Northern Telecom observes that numerous other parties have requested similar modifications to the power limits for licensed PCS and changes to the unlicensed PCS rules. Northern Telecom welcomes the support of these other petitioners. In

^{1/} Amendment of the Commission's Rules to Establish Personal Communications Services, GEN Docket No. 90-314, FCC 93-451, released October 22, 1993 ("PCS Order").

addition, a few proposals for reconsideration were raised that Northern Telecom will address in these comments.

With respect to the licensed PCS rules, Northern Telecom supports those petitioners seeking an increase in the base station power to 1600 watts EIRP. Northern Telecom also supports the petitioners seeking to designate different portions of the spectrum for mobile-to-base and base-to-mobile communications. However, while Northern Telecom strongly supports the role of voluntary, industry-developed standards, it urges the Commission to reject the requests of a few petitioners for the FCC to become actively involved in the standards setting process. Northern Telecom also requests that the Commission accept the Telocator proposal for out-of-band emission limits, including the notes accompanying the proposal as part of the rules.

With respect to the unlicensed PCS rules, Northern Telecom disagrees with the petitioners seeking to eliminate the channelization scheme adopted by the Commission in the PCS Order. Northern Telecom additionally urges the Commission to reject the pleas of a limited number of parties seeking to reallocate the unlicensed PCS spectrum so that the relatively uncongested spectrum is assigned solely to asynchronous devices. Northern Telecom also suggests that the Commission reject the request to expand the minimum listening period from 10 milliseconds to 20 milliseconds, and to raise the threshold for "cooperating devices," an undefined term. Finally, the Commission should

reject proposals to alter the certification rules or the references to UTAM. Each of these issues is discussed below.

I. Licensed PCS Issues

**A. The Record Supports An Increase
In The Maximum Base Station Power**

Northern Telecom requested in its Petition for Reconsideration an increase in the power limit for the PCS base stations to at least 1,000 watts EIRP. Numerous other petitioners requested an increase in the maximum power to 1,600 watts EIRP.^{2/} In its petition, Northern Telecom indicated that it had not studied power levels above 1,000 watts EIRP, but did not want to foreclose a higher power level. Before advocating a power in excess of 1,000 watts EIRP, Northern Telecom wanted to carefully evaluate the benefits and the adverse effects, if any, resulting from such an increase. Having conducted additional studies, Northern Telecom now supports a 1,600 watts EIRP base station power limit for licensed PCS.

In support of an increase to 1,600 watts EIRP, Northern Telecom is attaching an updated Moffet, Larson & Johnson, Inc. (MLJ) study that demonstrates that interference to existing microwave users would not materially increase as the rural cell power increased from 100 watts EIRP to 1,600 watts EIRP, and in

^{2/} Petitions for Reconsideration seeking an increase in the base station power limit include: American Personal Communications; Ameritech; MCI Telecommunications Corporation; Motorola, Inc.; Pacific Bell and Nevada Bell; Sprint Corporation; Telocator; and U S West, Inc.

some cases would decline. The results of this updated study are consistent with the earlier study, which showed that an increase in base station power limits to 1,000 watts would not increase interference to microwave licensees, and in some cases would decrease the number of paths adversely affected.

The new study demonstrates that a further increase in the maximum base station power from 1,000 watts EIRP to 1,600 watts EIRP will not cause additional interference to the point-to-point microwave users, while it will further reduce the number of base stations required to serve the licensed PCS territory. Table 1 summarizes the results of the MLJ study, which concludes that in the Washington, D.C. area with a 100 watts EIRP limit, a total of 336 paths would be adversely affected; with a 1,000 watts EIRP limit, a total of 293 paths would be adversely affected; and with a 1,600 watts EIRP limit, a total of 292 paths would be adversely affected.

Table 1			
Number of Paths Adversely Affected			
<u>Block</u>	<u>100 Watts</u>	<u>1000 Watts</u>	<u>1600 Watts</u>
A	35	34	35
B	42	45	42
C	47	38	41
D	48	43	43
E	67	66	69
F	64	44	37
G	33	23	25

The more recent MLJ study also includes microwave interference analyses for the "C" and "D" bands in the Washington, D.C. BTA. Time did not permit a complete evaluation of all bands before the reconsideration petition deadline, but Northern Telecom indicated that it would continue its studies. Northern Telecom's failure to include the "C" and "D" bands was due strictly to the limited time, and was not intended as a comment of the desirability of those bands. Thus, the MLJ study attached hereto includes band "C" and "D" information for all study models, and shows that the results for those bands are similar to the other frequencies.

Northern Telecom agrees with those petitioners who advocated 1,600 watts EIRP or 1,000 watts ERP as the maximum power limit for licensed PCS base stations. PCS operators will need to have cell sizes similar to the range of cellular systems in order to compete effectively. In addition, because of the build-out requirements, PCS licensees must provide service to the less dense populations that are present in all MTA and BTA territories. Northern Telecom has evaluated the feasibility of 1,600 watts base stations and concludes that PCS operators will derive significant new range benefits by using 1,600 watts EIRP. Northern Telecom believes that using its advanced technologies, which are made possible by increased base station power limits, 1,600 watts EIRP can be balanced with Mobile (or "fixed" transmitters) that emit 3 watts EIRP.^{3/} Thus, Northern Telecom

^{3/} Northern Telecom agrees with the petitioners that advocate
(continued...)

supports an increase in the base station power limit to 1,600 watts EIRP as an effective means of more economically deploying PCS, without any adverse consequences.

B. The Commission Should Reject Calls To Become More Actively Involved In The Standards Setting Process

The FCC has stimulated, rather than mandated, a pervasive industry need for standards, which has resulted in an aggressive standards program by ANSI accredited organizations. This program includes common air interface ("CAI") standards and networking standards that are essential to the roaming services that cellular consumers enjoy today. The scope and timetable of this industry standardization program was recently documented in a comprehensive Program Management Plan for PCS Standards (July 30, 1993), issued by Committee T1 (T1P1/93-073), TIA and others. Northern Telecom believes that further governmental oversight of standards is not required and may, in fact, retard the rapid formulation of complete CAI and networking interface standards.

Northern Telecom strongly supports the role of voluntary standards and the subsequent development of products adhering to ANSI accredited standards. We believe that the

3/(...continued)

an increase in the maximum power limit for certain mobile transmitters where health risks are not compromised. While Northern Telecom technology can achieve a balanced link at 3 watts EIRP, it would not object to a higher power limit for certain mobiles since other technologies and other specific types of mobile applications may warrant higher powers.

industry itself, comprised of operators, vendors and consumers, is in the best position to dictate what standards are necessary and when they should be implemented, and to define and ensure the level of conformance required to have a truly competitive service offering. Northern Telecom's position is based upon the following points:

Significant Delays To PCS Industry Formulation

The requirement for conformance to a CAI standard for type approval of equipment will significantly delay the formation of PCS business opportunities for the PCS operators competing for licensed spectrum and put them at a competitive disadvantage. Many of the potential PCS operators require early availability of product with the flexibility of delivering the service functionality which meets their individual business objectives and build-out deadlines for licensees. Awaiting the finalization of ANSI standards would preclude early deployment.

Damage To Global Competitiveness

ANSI developed standards are usually forward looking and it is quite common for services/products introduced on day 1 not to be fully in conformance to standards, but to evolve to be compliant with the standards which may themselves evolve as experience is gained. Mandating initial service compliance will further delay the introduction of new services/technology and the

resulting standards evolution, which will in turn damage U.S. international competitiveness.

CAI Insufficient To Achieve Objectives

While the petitions focus on the CAI to deliver roaming across license areas and competitive access, the standardization requirements to meet these objectives go well beyond just the CAI. The remaining objectives cannot be achieved without the additional standardization of the network signalling infrastructure, which will take significantly longer to resolve. The issue of multiple CAIs (standard or otherwise) can be resolved with multi-mode terminals, such as those implemented in the cellular networks today.

Increased Governmental Involvement, Rules And Processes

The implications of the TIA proposal to ensure roaming would require new processes within the Commission to accomplish this role. The necessary rules to oversee and arbitrate this process will be difficult for the Commission to define and implement. Moreover, TIA's pleading is in direct opposition to long held industry views about the appropriate role for the FCC in the standards setting process, and contradicts the support for a voluntary, rather than mandatory, standards process that the United States has advocated to foreign standards organizations.

Disruptive Influence On ANSI Standards Process

Public standards are developed through a consensus process among member companies that have varied commercial interests. The process requires compromises which are achievable since, in most cases, there is only an incremental impact on products/services. Government adoption of the output of the process as a mandatory requirement can raise the stakes to an "all or nothing" impact on a company's particular technology or service, and thus impede, or even stop, the give and take of the consensus process.

In summary, Northern Telecom continues to believe that the Commission should leave it to the industry to develop the necessary voluntary standards, and should not at this time increase its involvement by requiring type approval to be conditioned on conformance to ANSI accredited standards. The current efforts of the Commission are sufficient to create a competitive PCS industry in an expedited timeframe. Given the aggressive ANSI programs which have already been launched, no further FCC involvement or oversight is necessary.

C. Spurious Emission Limits

Northern Telecom supports the Telocator proposal for extension of the out-of-band power requirements to any frequency outside a licensed block to prevent any licensed or unlicensed PCS operator from interference emissions generated by any counterpart. The proposed attenuation level defined by § 99.234

of the new rules ($[43+10\log_{10}P]$ or 80 dB, whichever is the lesser attenuation), should be extended to any frequency out of the licensed block pair.

In addition, a measurement bandwidth should be defined for this out-of-band power requirement, taking into account the potential multiple technology environment of PCS. Indeed, CDMA or TDMA on one side, and/or FDD or TDD systems on the other side, could be selected by PCS operators. All will define their own channel bandwidth and time sharing schemes. An attenuation definition should be clear enough to define the worst case maximum power to be faced by a PCS system, for both out-of-band and in-band emissions generated by other PCS systems, whatever is its system bandwidth and multiple access technique.

As a consequence, Northern Telecom supports the Telocator proposal for the addition of a supplementary NOTE in § 99.234, stating that a measurement bandwidth of 1% of the signal bandwidth should be used for measurement purpose.^{4/}

Northern Telecom also proposes to add to the Telocator proposal a clarification that the measurement conditions should be such that the system operates at its maximum defined capacity during the spurious measurement. In addition, although § 99.234 does not give the exact definition of the point of measurement of the out-of-band emissions, Northern Telecom understands that the

^{4/} In its petition for reconsideration, Northern Telecom also indicated that on any frequency outside the PCS licensed spectrum separated by more than 1.25 MHz from the edge of the licensed band, the emissions shall be below -30 dBm in a 100 kHz measurement bandwidth. This level should be measured at the base station and mobile unit antenna ports.

spurious emissions attenuation should be measured at any measurement point selected for the transmitted signal. Northern Telecom urges the Commission to confirm this interpretation.

**D. Allocated Pairs For Uplink
And Downlink Signals**

As indicated by other petitioners, without clear guidance on which of the paired blocks of the licensed bandwidth should be used for uplink (Terminal to Base station) or downlink (Base station to Terminal) transmissions, the level of interference to be faced by either the terminal or the network could require uneconomic or impractical solutions for implementation of the required filtering. For example, as a consequence of the auction process, a terminal working in a selected technology in Block A in MTA X, would have to be protected against spurious emissions from a Base station working on another technology in Block B in the same MTA, as the same terminal while roaming would have to work in Block B with the same technology as before in MTA Y, and would have to be protected against the spurious emissions of a base station operating in Block A in another technology in MTA Y.

In order to minimize the potential interference problems, Northern Telecom recommends that the Commission define clearly that the lower part of the paired blocks (1850-1890 MHz for Blocks A, B, and C, and 2130-2150 MHz for Blocks D to G) should be used for the Mobile station to Base station direction, and the higher part of the paired blocks (1930-1970 MHz for

Blocks A, B, and C, and 2180-2200 MHz for Blocks D to G) should be used for the Base station to Mobile direction.

The selection of the lower band for the mobile transmit bandwidth is a conventional economical choice, because the lower band gives a small advantage in terms of propagation and output power, which is suitable to assign to the low cost part of the system. TDD systems should be possible with the restriction that any TDD system operating in the lower part of the licensed band (1850-1890 MHz and 2130-2150 MHz) would be restricted to the power limitation of a PCS subscriber unit. TDD systems operating in the higher part of the licensed band (1930-1970 MHz and 2180-2200 MHz) would be restricted to the power limitation of a PCS base station.

II. Unlicensed PCS Issues

A. Channelization

Three of the petitions for reconsideration sought modification of the Commission's channelization of the unlicensed PCS spectrum dedicated to isochronous devices.^{5/} Those petitioners seek to modify the channelization of the band to permit additional wideband transmissions. Ostensibly, they argue that such a change will permit additional technologies to operate in the band. Northern Telecom is concerned that such a change will likely lead to inefficient use of the spectrum.

^{5/} Ericsson Corporation; LACE, Inc.; and Rockwell International Corporation.

As Motorola observes, a single transmitter would be able to monopolize a large portion of the band if such wideband channels are utilized.^{6/} Indeed, the control and signalling channel of a single cell could occupy 5 MHz of spectrum, even if there is no communication activity ongoing. In addition, greater co-existence of alternative technologies and systems could be achieved with use of 1.25 MHz channels. WINForum, in its spectrum etiquette, sought to achieve fair access to the available frequencies, and determined that 1.25 MHz channels best balance the competing interests. Northern Telecom agrees, and thus supports Motorola's request to utilize the 1.25 MHz channels throughout the unlicensed PCS spectrum. In no event, however, should the Commission further retreat from the channelization scheme proposed by WINForum. Thus, the Commission should deny the petitions for reconsideration filed by Ericsson, Rockwell and LACE seeking the elimination of the 1.25 MHz channels.

B. Spectrum Allocation

Two companies have filed petitions for reconsideration that repeat the request of Apple and seek to allocate the relatively uncongested 1910-1930 MHz band solely to devices operating in asynchronous transmission modes. Northern Telecom has previously demonstrated how such a division of the unlicensed spectrum would ill serve the public interest, and will not repeat

^{6/} Motorola Petition at p. 12.

the detailed analysis here.^{7/} In sum, however, the request for assigning the 1910-1930 MHz band to asynchronous devices merely to allow the early deployment of "peer-to-peer" devices ignores the "coordinatability" of many data PCS devices, and threatens the early deployment of coordinatable isochronous devices, which in turn will serve as the likely source of funding for clearing the band.

C. Listen-Before-Talk

Two of the petitioners seek a modification of the rule for unlicensed PCS to specify an increase in the minimum time for listening before a device can begin transmitting, from 10 milliseconds to 20 milliseconds.^{8/} Northern Telecom urges the Commission to reject this request. As an initial matter, Northern Telecom observes that an increase in the minimum listening time in order to support new technologies is unnecessary, since the rules already permit devices to utilize a longer listening time if desired. Section 15.321(c)(1) of the rules specifies that devices are required to listen for "at least" 10 milliseconds.

Moreover, increasing the minimum for all devices will adversely affect the public interest. A longer mandatory

^{7/} See generally, Comments of Northern Telecom on the Apple Emergency Petition, filed November 8, 1993; Reply Comments of Northern Telecom on the Apple Emergency Petition, filed November 19, 1993.

^{8/} Rockwell International Corporation Petition at pp. 5-6; Telocator Petition at p. 20.

listening period will increase the time needed to set up a call by doubling the time necessary for scanning the channels. As the Commission is aware, subscribers can become very dissatisfied with long call set up times.^{9/} WINForum carefully considered these issues in developing a consensus on the minimum listening period, and the Commission should not alter that determination, particularly since the rules merely prescribe a minimum, and do not foreclose a vendor from implementing a longer listening period if it desires.

D. Listen-Before-Talk Threshold

Spectralink in its petition proposes that the Commission raise the threshold for interference between "cooperating" devices. The term "cooperating devices" is not defined, however. Northern Telecom suggests that if the Commission determines that a higher threshold is appropriate, then it should apply that standard to all devices, rather than attempting to create artificial (and unclear) distinctions between unlicensed PCS devices.

^{9/} E.g., Provision of Access for 800 Service, 4 FCC Rcd 2824 (1989).

E. Certification Of Unlicensed PCS Equipment

AT&T seeks in its petition for reconsideration to add a large measure of detail to the rules so as to specify measurement and testing procedures, including allowing the ANSI C63 standards body to develop industry standard criteria.^{10/} AT&T alleges that the general provisions and requirements for "good engineering practice" are inadequate. Northern Telecom urges the Commission to reject the AT&T request. Northern Telecom recognizes that over time, the Commission may wish to specify in greater detail some of the testing procedures. However, the current rules are presently adequate to allow products to be developed and deployed. Awaiting the development of perfect testing procedures before any products can be certified, as proposed by AT&T, will significantly delay the implementation of unlicensed PCS.^{11/} Thus, Northern Telecom does not believe that any testing procedure rule changes are necessary at this time, and the concomitant delays would disserve the public interest.

^{10/} AT&T Petition at pp. 2-6.

^{11/} Cf., MCI Telecommunications Corporation v. FCC, 627 F.2d 322, 341-42 (D.C. Cir. 1980) ("the best must not become the enemy of the good, as it does when the FCC delays making any determination while pursuing the perfect tariff").

F. Apple's Comments Regarding UTAM

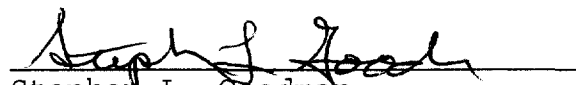
In its petition for reconsideration, Apple appears to challenge the good faith of UTAM in complying with the instructions of the Commission. Northern Telecom believes these attacks are unwarranted. UTAM is an open forum where anyone is welcome and constructive suggestions are embraced. Northern Telecom anticipates that UTAM will successfully develop and implement a plan for clearing the spectrum for both asynchronous and isochronous devices, and that it will fairly coordinate deployment of coordinatable unlicensed PCS devices until the bands are cleared. Northern Telecom urges Apple to support those efforts through active participation in UTAM. The Commission retains the authority to address any problems that may arise in the future, and it need not presume that UTAM will fail to comply with instructions as Apple implies. Northern Telecom believes that the Commission should reject Apple's proposed changes to the rules to eliminate the references to UTAM.

CONCLUSION

Northern Telecom generally supports the Commission's PCS Order as explained in its petition for reconsideration. Northern Telecom did suggest some critical changes, including an increase in the power limit for licensed PCS base stations and modification of the unlicensed PCS rules to reflect more closely the WINForum Spectrum Etiquette. Many of the other parties seeking reconsideration requested similar relief. Northern

Telecom additionally supports the requests for an increase in the power limit to 1,600 watts EIRP, as well as the designation of portions of the bands for base-to-mobile and mobile-to-base transmissions. Although Northern Telecom supports industry developed voluntary standards, it objects to those petitioners seeking to have the Commission become deeply enmeshed in the standards setting process. Finally, Northern Telecom urges the Commission to deny those petitions seeking even further retreats from the consensus reflected in the WINForum Spectrum Etiquette that has been incorporated into the unlicensed PCS rules. By taking these actions, the Commission will create rules for PCS that best serve the public interest.

Respectfully Submitted,

A handwritten signature in dark ink, appearing to read "Stephen L. Goodman", is written over a horizontal line.

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December 30, 1993

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I, Laura E. Magner hereby certify that on the 30th day of December 1993, a true copy of the foregoing Reply Comments of Northern Telecom Inc. was mailed, postage prepaid, to the following:

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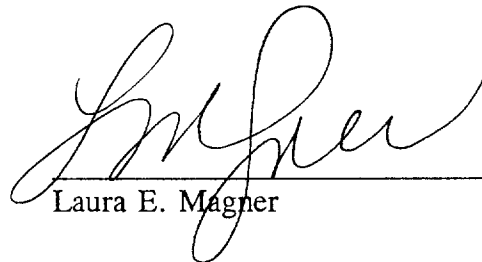
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